



UNITED STATES MARINE CORPS
Marine Corps Engineer School
Marine Corps Base
Camp Lejeune, North Carolina 28542-5040

IN REPLY REFER TO
1500
ACAD
28 Jan 86

UTILITIES OFFICER PROGRAM OF INSTRUCTION Ch 1

From: Commanding Officer, Marine Corp Engineer School
To: Distribution List

Subj: UTILITIES OFFICER (UO) PROGRAM OF INSTRUCTION (POI); CHANGE TO

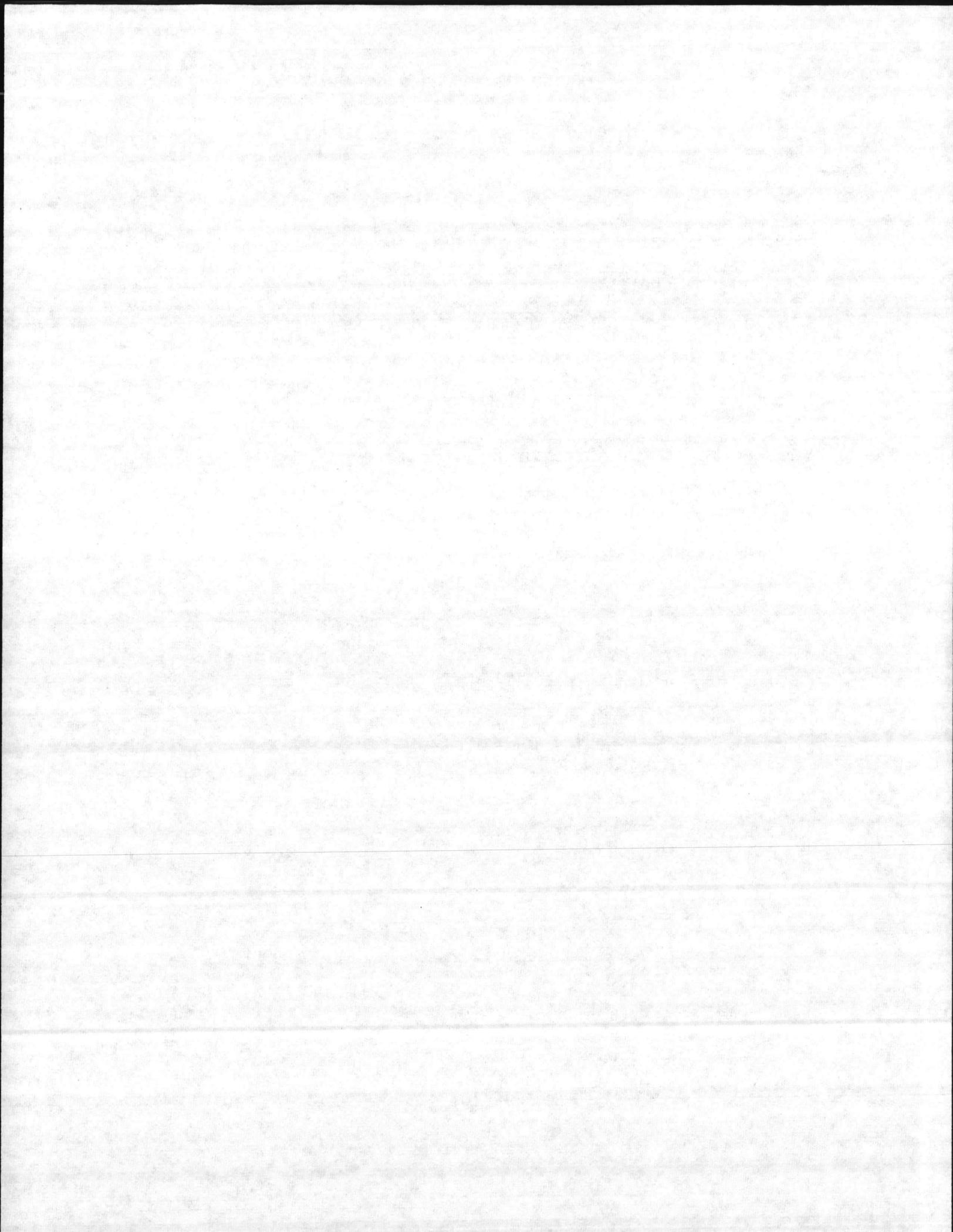
Encl: (1) New page inserts to UO POI

1. Purpose. To transmit page changes to the basic POI.
2. Action. Remove present pages IV-I-7 and IV-I-8 and replace with corresponding pages contained in the enclosure hereto.
3. Summary of Changes. Quality Reliability Report deleted.
4. Filing Instruction. This Change transmittal will be filed immediately following page i of the basic POI.

M. B. Foore
M. B. FOORE
By direction

DISTRIBUTION: As required locally plus

CG, MCDEC	5
CG, FMFLant	2
CG, FMFPac	2
CG, I MAF	2
CG, II MAF	2
CG, III MAF	2
CG, 1st MarDiv	2
CG, 1st MAW	2
CG, 1st FSSG	2
CG, 2d MarDiv	2
CG, 2d MAW	2
CG, 2d FSSG	2
CG, 3d MarDiv	2
CG, 3d MAW	2
CG, 3d FSSG	2
CG, 4th MarDiv	2
CG, 4th MAW	2
CG, 4th FSSG	2
CG, 1st MarBde	2
CG, LFTCLant	2
CG, LFTCPac	2



UNITED STATES MARINE CORPS
Marine Corps Engineer School
Marine Corps Base
Camp Lejeune, North Carolina 28542

1500/02
ACAD

15 Apr 1985

1. The program of instruction (POI) for the Utilities Officer Course is submitted in accordance with MCO 1500.42 for review and approval.
2. The changes to this POI have been developed in accordance with MCDECO P1553.1A (Instructional Systems Development) and constitute minor revisions. The Course Descriptive Data for this course has been approved and authorized by the Commandant of the Marine Corps (T) letter TDG-32 wls 1500 of 8 February 1984.

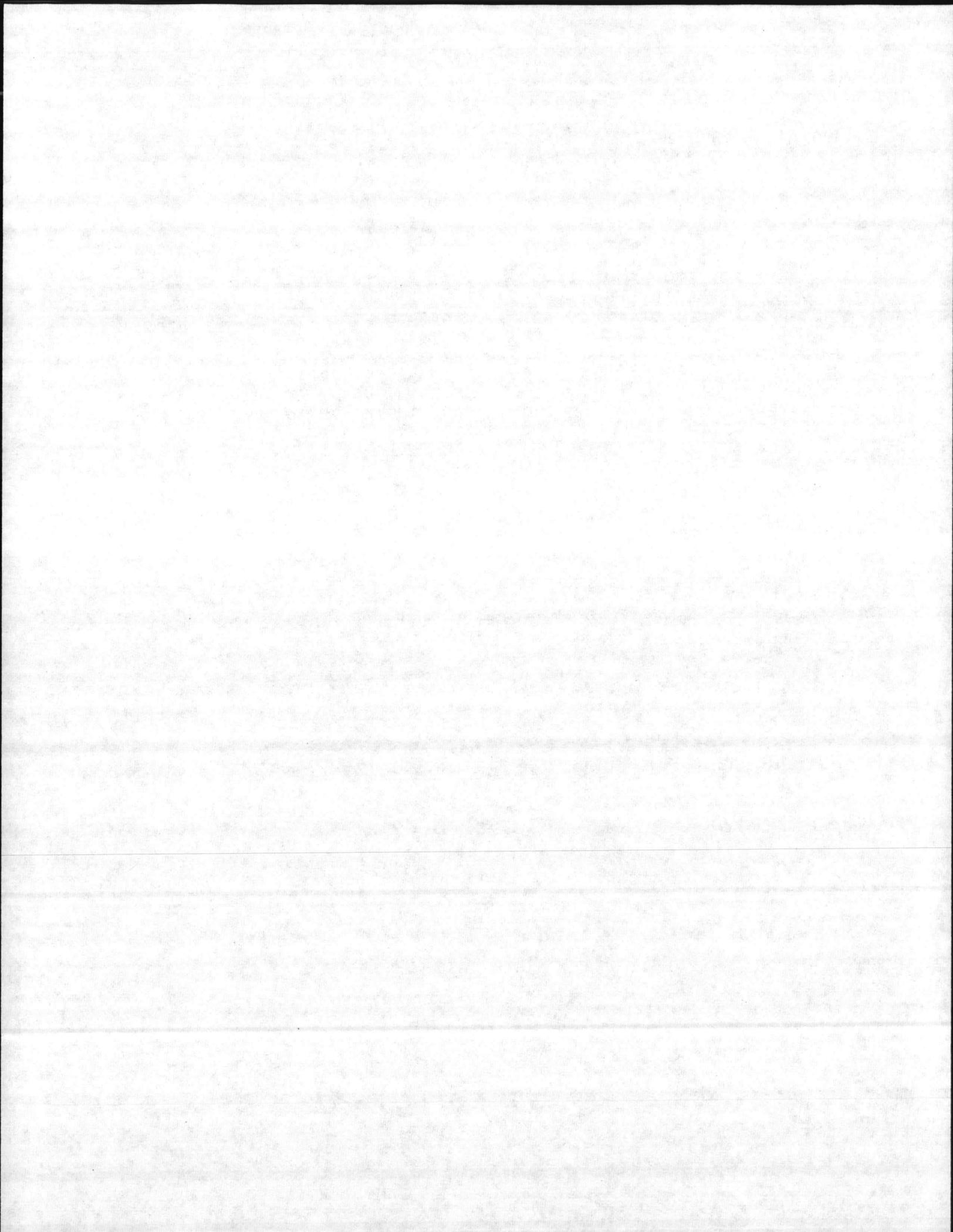

T. J. DALZELL
Colonel USMC
Commanding

UNITED STATES MARINE CORPS
Marine Corps Development and Education Command
Quantico, Virginia 22134-5050

1500
E 033F/3
8 JUN 1985

This program of instruction has been reviewed for course content and for adherence to the provisions of MCDECO P1553.1A and is approved.

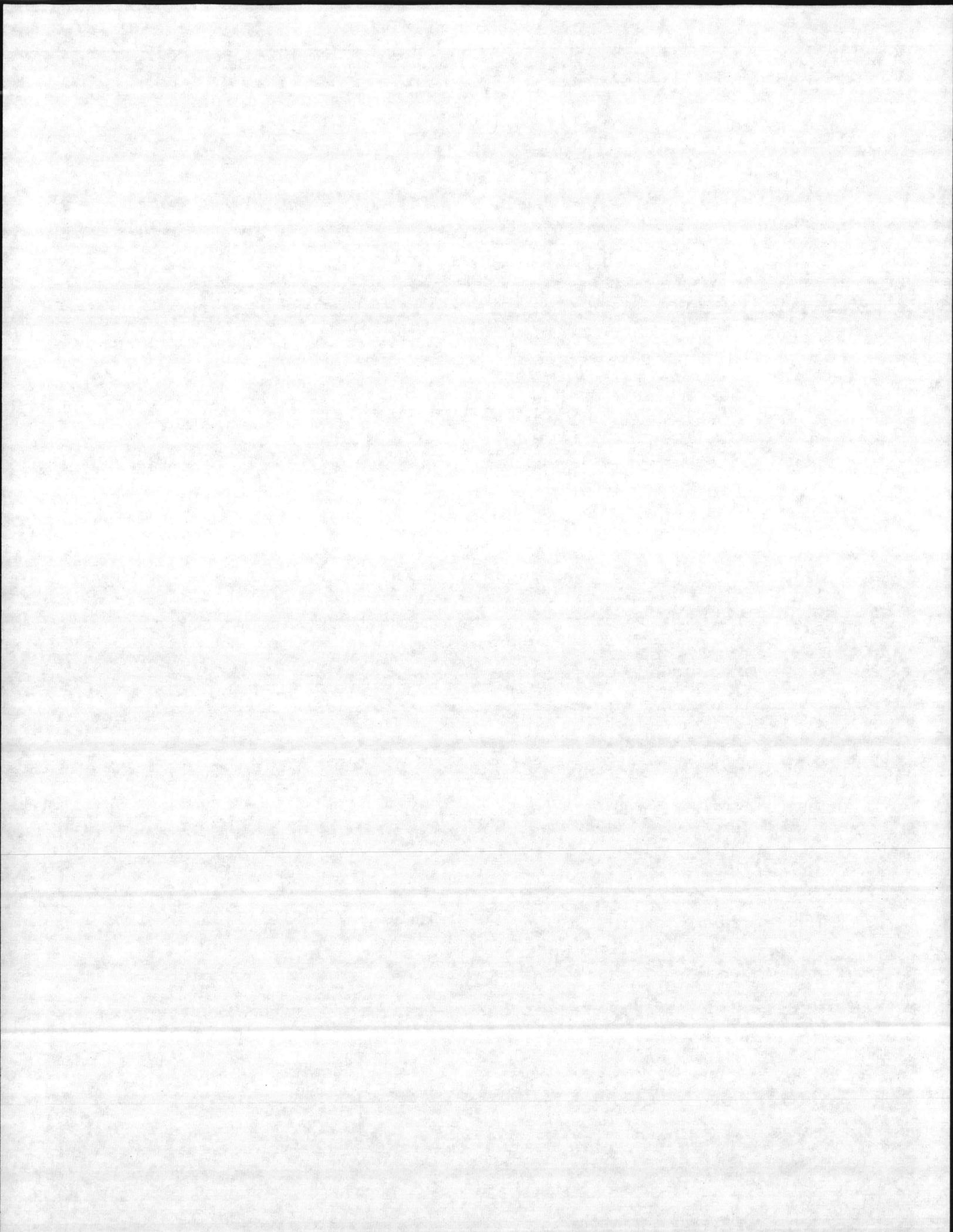

H. W. GREENUP
By direction



UTILITIES OFFICER COURSE

CONTENTS

<u>SECTION</u>	<u>TITLE</u>
I	PREFACE
II	SUMMARY
III	BODY
IV	ANNEXES
V	STUDENT PERFORMANCE EVALUATION
VI	TASK INVENTORY
VII	COURSE EVALUATION
VIII	DISTRIBUTION



UTILITIES OFFICER COURSE

SECTION I - PREFACE

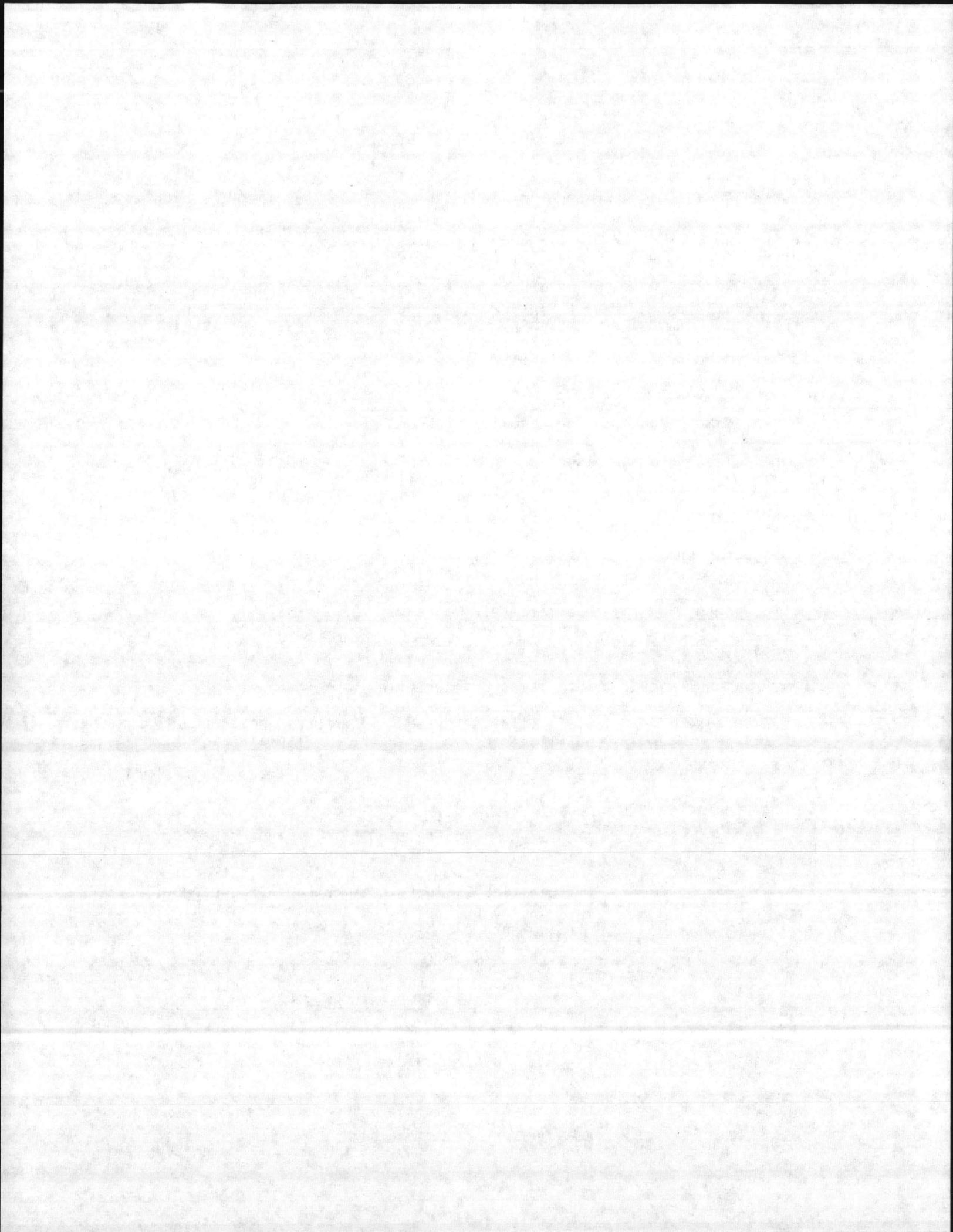
1. The Utilities Officer course is designed to provide instruction for the tasks and goals listed in Section VI of this POI. The terminal learning objectives for the lessons in Section IV have been developed from the task list. Both the task inventory and learning objectives are continually validated and refined through the procedures set forth in Section VII.

2. All agencies and commands receiving graduates of this course and, specifically, those cited in Section VIII, are requested to review the contents of this POI and evaluate the performance of their graduates against field requirements and submit comments and recommendations to:

Commanding Officer
Marine Corps Engineer School
Camp Lejeune, North Carolina 28542

3. The following information for this course has been submitted for inclusion in the current edition of MCO P1500.12 (Formal Schools Catalog):

- a. Title: Utilities Officer Course
- b. Location: Marine Corps Engineer School
Camp Lejeune, North Carolina 28542
- c. Length: Peacetime (P): 61 Days/12 Weeks, 1 Day
Mobilization (M): 51 Days/8 Weeks, 3 Days
- d. MOS for Which Trained: Utilities Officer (1120)
- e. Purpose: To qualify selected officer personnel for duty as utilities officers in the Fleet Marine Force.
- f. Scope: The course focuses on management of resources and personnel in the Utilities Occupational Field. Mathematics review is directed toward shop formulas and mathematics related to plumbing, hygiene, electrical, and refrigeration sections. The course consists of the following units of instruction: mathematics, electricity concepts, construction print reading, refrigeration/air conditioning management, plumbing management, water supply management, hygiene management, electrical management, and maintenance management. Emphasis of practical exercises during the course is on scenarios developed for different contingency operating areas.
- g. Prerequisites: Captain-Warrant Officer. Experience in Occupational Field 11 desirable.



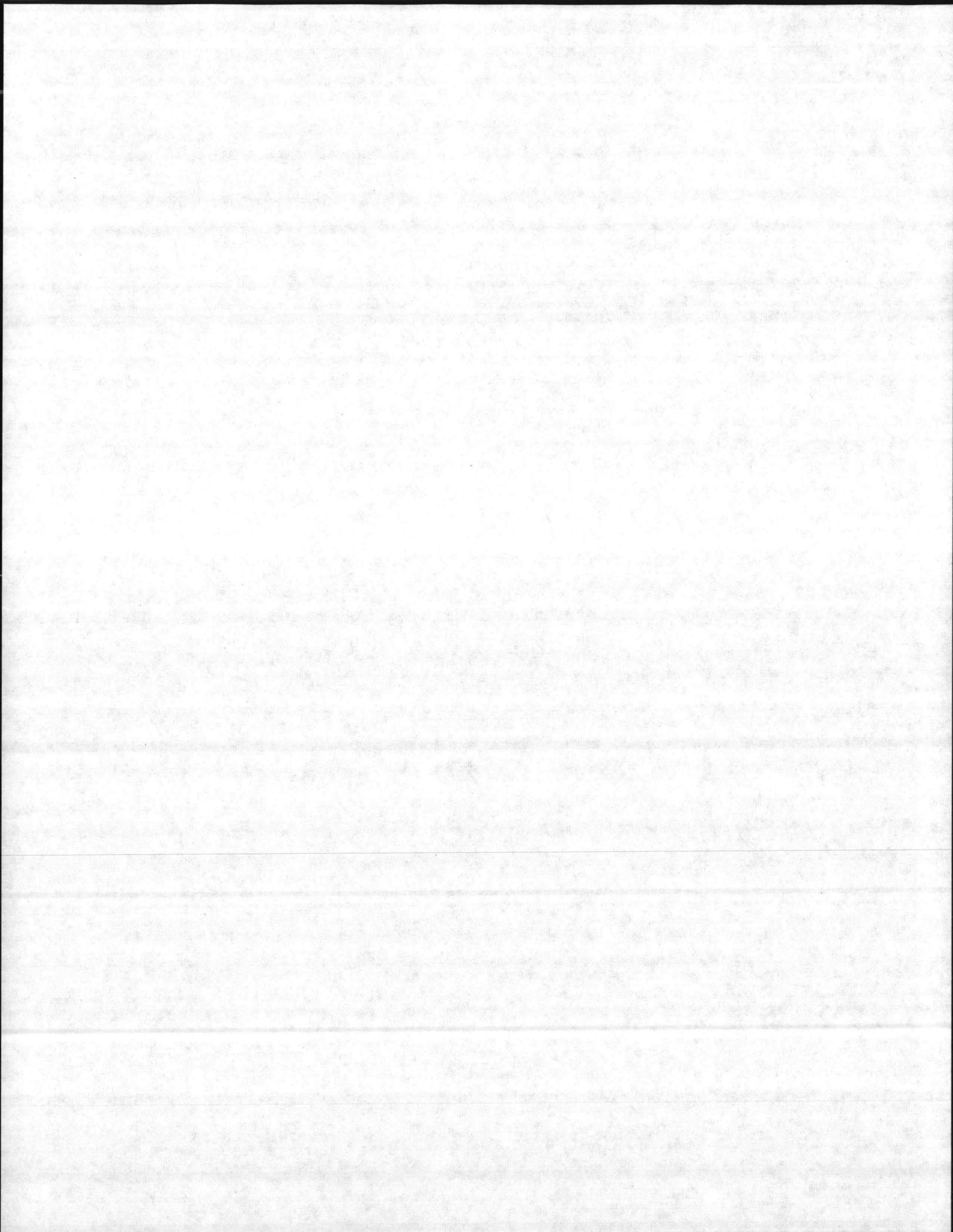
UTILITIES OFFICER COURSE

SECTION I - PREFACE

- h. Class V Requirements: None
- i. Classification: None
- j. Quota Control: CMC
- k. Funding: CMC
- l. Reporting Instructions: Students report to Commanding General, MCB, CLNC
- m. Capacity/Frequency: 10/1 time per year
- n. Service School Code: ACE
- o. Instructor Staffing Requirements:

Instructor requirements have been determined using the current edition of MCO P5320.5. Listed below are the specific instructor requirements for the curriculum contained in this POI.

<u>NUMBERS</u>	<u>GRADE</u>	<u>MOS</u>
1	Lt - Lt Col	1310
1	WO-1 - CWO-4	1120
1	GySgt	1349
1	GySgt	1169
1	SSgt	1371
1	SSgt	1142
1	SSgt	1141
1	SSgt	1161
1	SSgt	5711
1	SSgt	1171
1	Civ	Math Instr



UTILITIES OFFICER COURSE

SECTION - II SUMMARY

Course Length: 12 Weeks, 1 Day (58 Training Days)

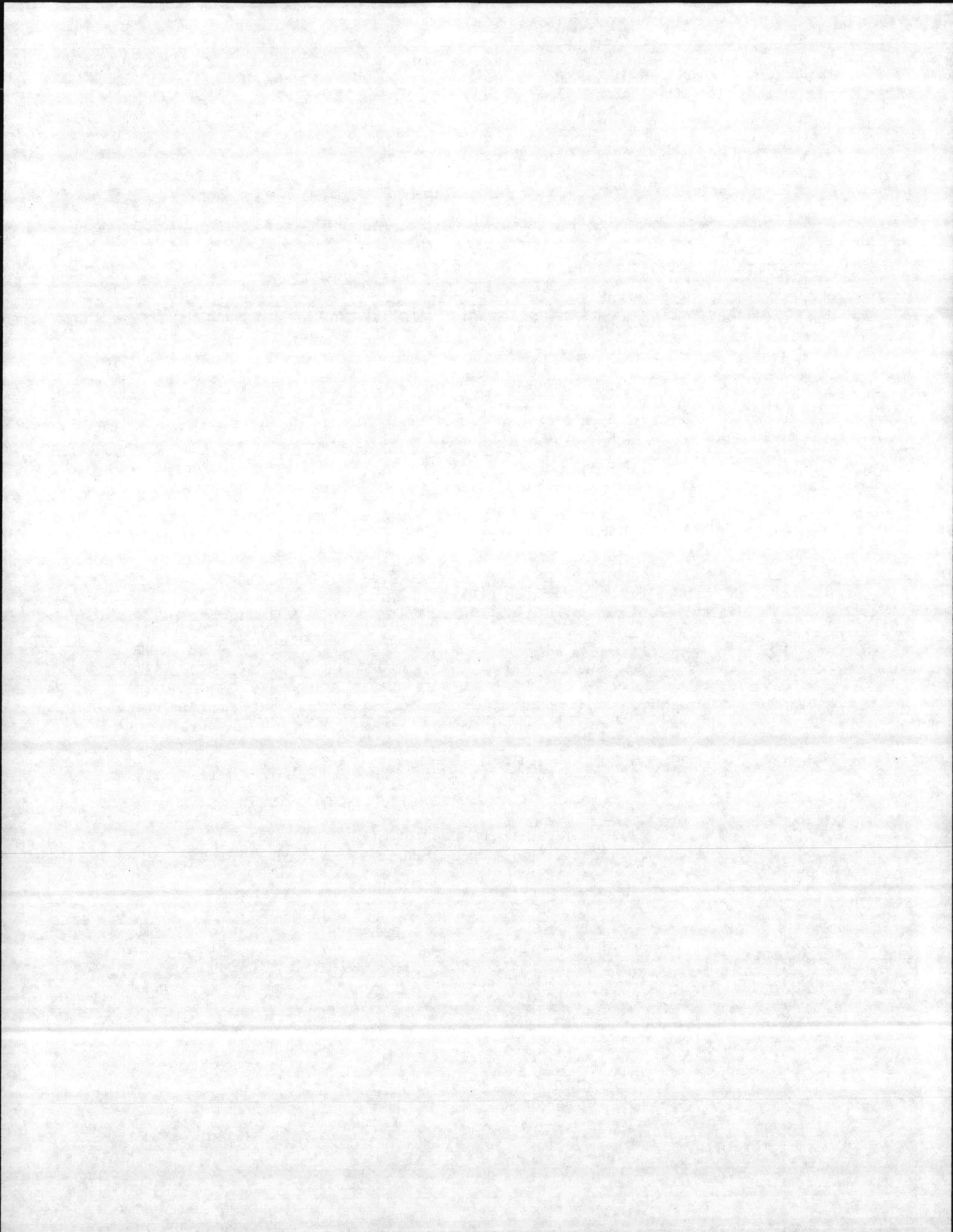
<u>ACADEMIC</u>	<u>HOURS</u>		<u>ANNEX</u>
	<u>P</u>	<u>M</u>	
Mathematics Review	28	28	A
Electricity Concepts	27	27	B
Construction Print Reading	6	6	C
Refrigeration/Air Conditioning Management	45	45	D
Plumbing Management	15	15	E
Water Supply Management	57	57	F
Hygiene Management	13	13	G
Electrical Management	80	80	H
Maintenance Management	60	60	I
General Subjects	30	30	J
Evaluation	<u>45</u>	<u>45</u>	
SUBTOTAL	406	406	
<u>NONACADEMIC</u>			
Administrative Time	43	20	
Physical Fitness	<u>35</u>	<u>0</u>	
SUBTOTAL	78	20	
GRAND TOTAL	484	426	

UTILITIES OFFICER COURSE

SECTION II - SUMMARY

REVISION DATA

<u>LESSON DESIGNATOR</u>		<u>LESSON TITLE</u>	<u>HOURS</u>				<u>RATIONALE</u>
<u>PREVIOUS</u>	<u>CURRENT</u>		<u>Old</u>		<u>New</u>		
			<u>P</u>	<u>M</u>	<u>P</u>	<u>M</u>	
U-02D12	U-02D15	Refrigeration Systems Repair	1	1	7	7	more information needed by
-	U-02D12	Use of Refrigeration Testing Devices	0	0	6	6	Utilities Officer for supervision of
-	U-02D13	Refrigeration Troubleshooting	-	-	4	4	refrigeration section.
-	U-02D14	Electrical Systems Troubleshooting	-	-	5	5	
U-02F04	U-02F04	Equipment Inspection	4	4	5	5	More time for application.
U-02F05	U-02F05	600 GPM Water Purification Unit	5	5	6	6	-DO-
U-02F08	-	Distillation Unit	2	2	0	0	Equipment obsolete.
U-02H06	-	Generator Familiarization	2	2	1	1	Less time needed.
U-02H12	U-02H12	Electrical Distribution Implementation	29	29	20	20	-DO-
U-02H16	U-02H16	Construct Interior Electrical System	14	14	11	11	-DO-
-	U-02J03	Introduction to NBC	0	0	1	1	
-	U-02J04	Field Planning Exercise	0	0	21	21	To provide application exercise.



UTILITIES OFFICER COURSE

SECTION IV - ANNEXES

ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F01

LESSON TITLE: INTRODUCTION TO HYGIENE

<u>HOURS</u> <u>P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
1	L	T, TP, HO

LESSON PURPOSE: To provide the Utilities Officer with an overall view of the training afforded the Basic Hygiene Equipment Operator and Journeyman Hygiene Equipment Operator.

REFERENCE(S):

MOS Manual
POI Basic Hygiene Equipment Operator
POI Journeyman Hygiene Equipment Operator

UTILITIES OFFICER COURSE
SECTION IV - ANNEXES
ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F02

LESSON TITLE: INTRODUCTION TO MILITARY
WATER SUPPLY

<u>HOURS</u> <u>P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
2	L	TP, T, HO

LESSON PURPOSE: To familiarize the Utilities Officer with the characteristics of water, the terminology used in water supply, and the hydrologic cycle.

NOTE: Learning objectives are neither specified nor measured during the Lesson.

REFERENCE(S):

TM 5-700

UTILITIES OFFICER COURSE
SECTION IV - ANNEXES
ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F03

LESSON TITLE: 3,000 GALLON TANK

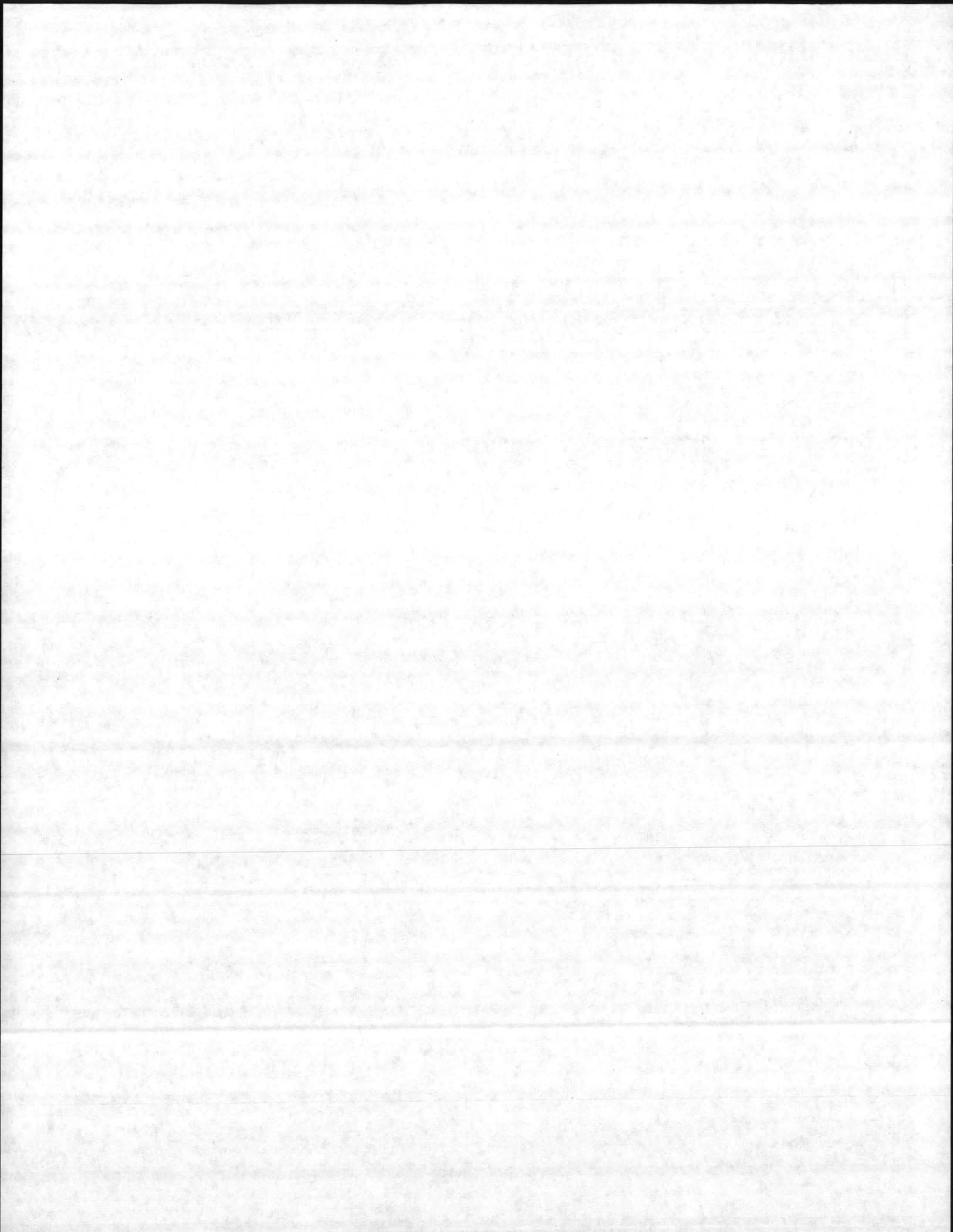
<u>HOURS</u> <u>P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
1	L, D	ITV, AIO

LESSON PURPOSE: To familiarize the students with the installation of a 3,000 gallon collapsible tank.

NOTE: Learning objectives are neither specified nor measured during the lesson.

REFERENCE(S):

TM 01056C-14



UTILITIES OFFICER COURSE
SECTION IV - ANNEXES
ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F04

LESSON TITLE: EQUIPMENT INSPECTION

<u>HOURS P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
5	L, D, A(I)	HO, TP, T, AIO

TERMINAL LEARNING OBJECTIVE(S):

Provided with a water purification unit which has had quarterly preventive maintenance performed, appropriate technical manual, and the completed NAVMC 10560 (Worksheet for Quarterly Preventive Maintenance and Limited Technical Inspections), inspect the unit for thoroughness of maintenance in accordance with Equipment Technical Manual, chapters 2 and 3. (1.3.4)

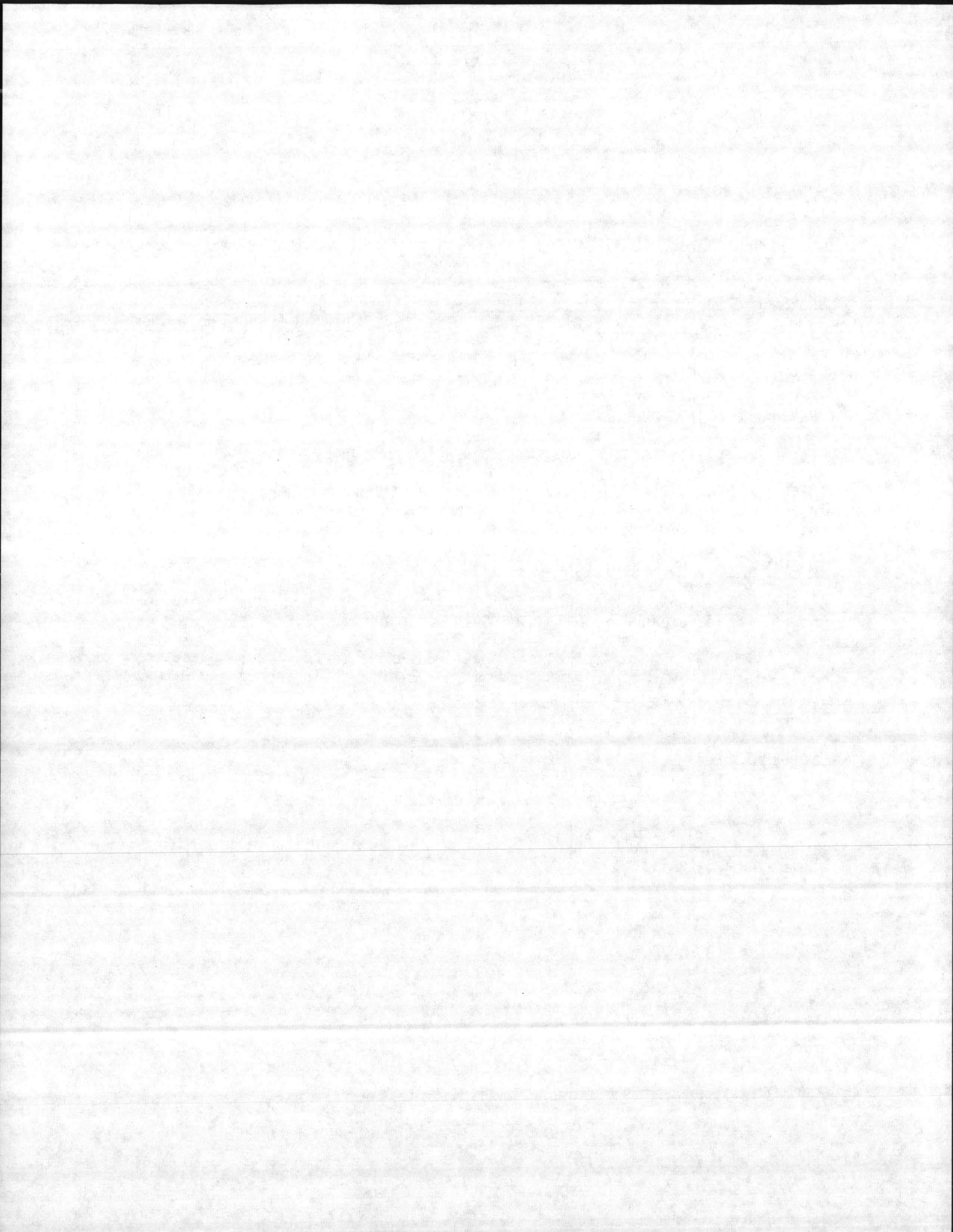
ENABLING LEARNING OBJECTIVE(S):

1. Provided with a water purification unit, point out each major component of the unit in accordance with TM-01056C-14, chapter 1. (1.3.4a)
2. Provided with a list of maintenance indicators, circle each indicator which will affect the water purification unit's performance in accordance with TM-01056C, chapters 2 and 3. (1.3.4b)

REFERENCE(S):

TM-01056C-14
TM 5-4610-215-10

NOTE: The specific water purification unit to be inspected will be based on equipment availability.



UTILITIES OFFICER COURSE

SECTION IV - ANNEXES

ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F05

LESSON TITLE: 600 GPH WATER PURIFICATION
UNIT (ERDLATOR)

HOURS
P-M

METHODS

TRAINING SUPPORT EQUIPMENT

6

L, D, A(I)

AIO, HO, B

ENABLING LEARNING OBJECTIVE(S):

1. Provided with a 600 GPH water Purification Unit (Erdlator), point out each major component of the unit in accordance with TM 03957A-15, chapter 2. (1.3.4c)
2. Provided with a list of maintenance indicators, circle each indicator which will affect the 600 GPH Water Purification Unit's performance in accordance with TM 03957A-15, chapter 2. (1.3.4d)

REFERENCE(S):

TM 03957A-15

UTILITIES OFFICER COURSE

SECTION IV - ANNEXES

ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F06

LESSON TITLE: 1500 GPH WATER PURIFICATION
UNIT (ERDLATOR)

<u>HOURS</u> <u>P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
2	L, D	HO, F(35), S, AIO

LESSON PURPOSE: To familiarize student with the 1500 GPH Water Purification Unit (Erdlator) capabilities and power requirements.

NOTE: Learning objectives are neither specified nor measured during the lesson.

REFERENCE(S):

TM 04461A-15

UTILITIES OFFICER COURSE
SECTION IV - ANNEXES
ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F07

LESSON TITLE: REVERSE OSMOSIS WATER
PURIFICATION UNIT

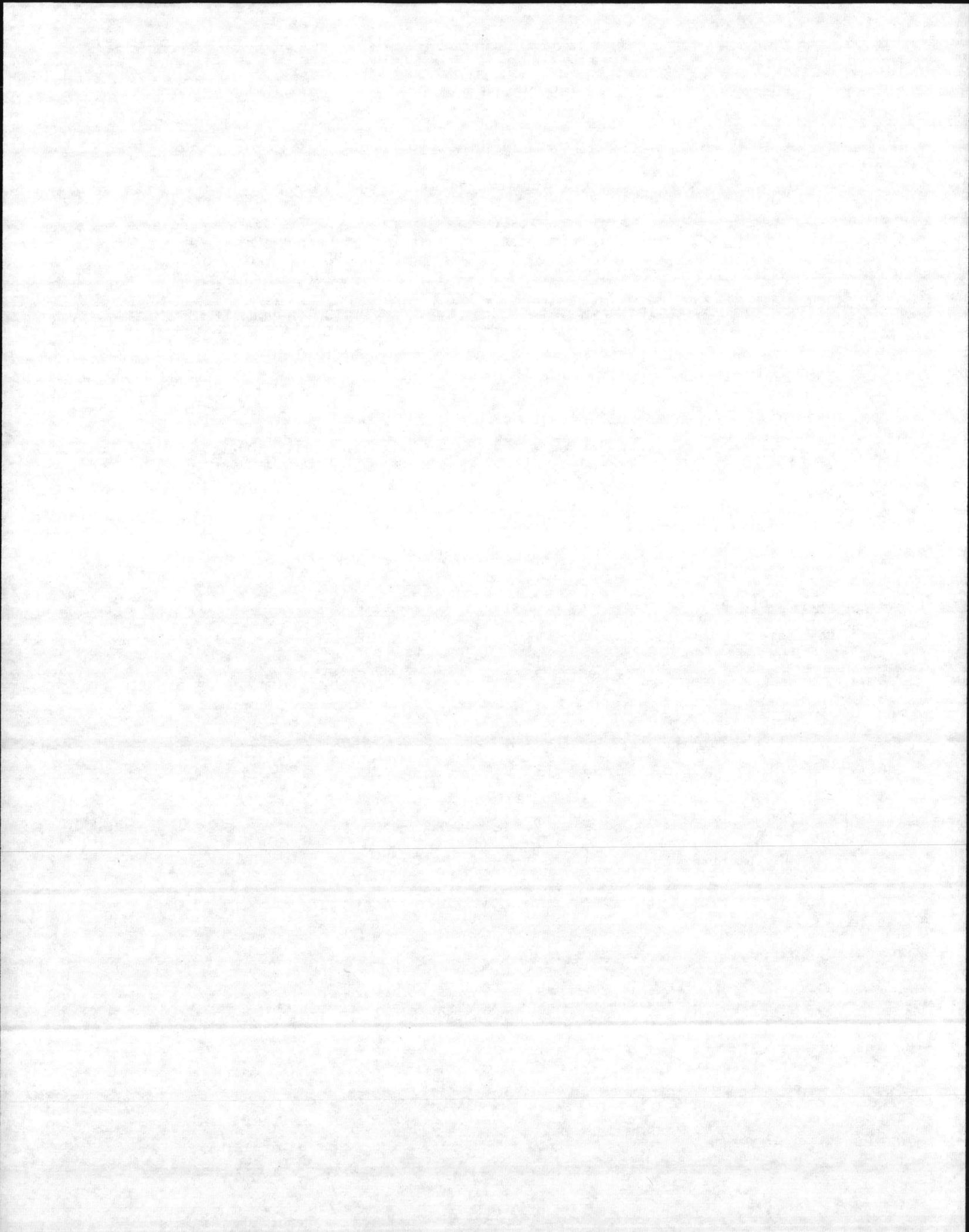
<u>HOURS</u> <u>P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
21	L, D, A(I)	B, T, TP, AIO

ENABLING LEARNING OBJECTIVE(S):

1. Provided with a Reverse Osmosis Water Purification Unit, point out each major component of the unit in accordance with TM 5-4610-215-10, chapter 2. (1.3.4e)
2. Provided with a list of maintenance indicators, circle each indicator which will affect the Reverse Osmosis Water Purification Unit's operation in accordance with TM 5-4610-215-10, chapter 2. (1.3.4f)

REFERENCE(S):

TM 5-4610-215-10



UTILITIES OFFICER COURSE
SECTION IV - ANNEXES
ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F09

LESSON TITLE: SINGLE DIAPHRAGM
RECIPROCATING PUMP

<u>HOURS</u> <u>P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
1	L	HO, T, TP

LESSON PURPOSE: To familiarize students with the capabilities of the Single Diaphragm Reciprocating Pump.

NOTE: Learning objectives are neither specified nor measured during the lesson.

REFERENCE(S):

TM 5-4320-252-14

UTILITIES OFFICER COURSE

SECTION IV - ANNEXES

ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F11

LESSON TITLE: WATER SOURCE DEVELOPMENT

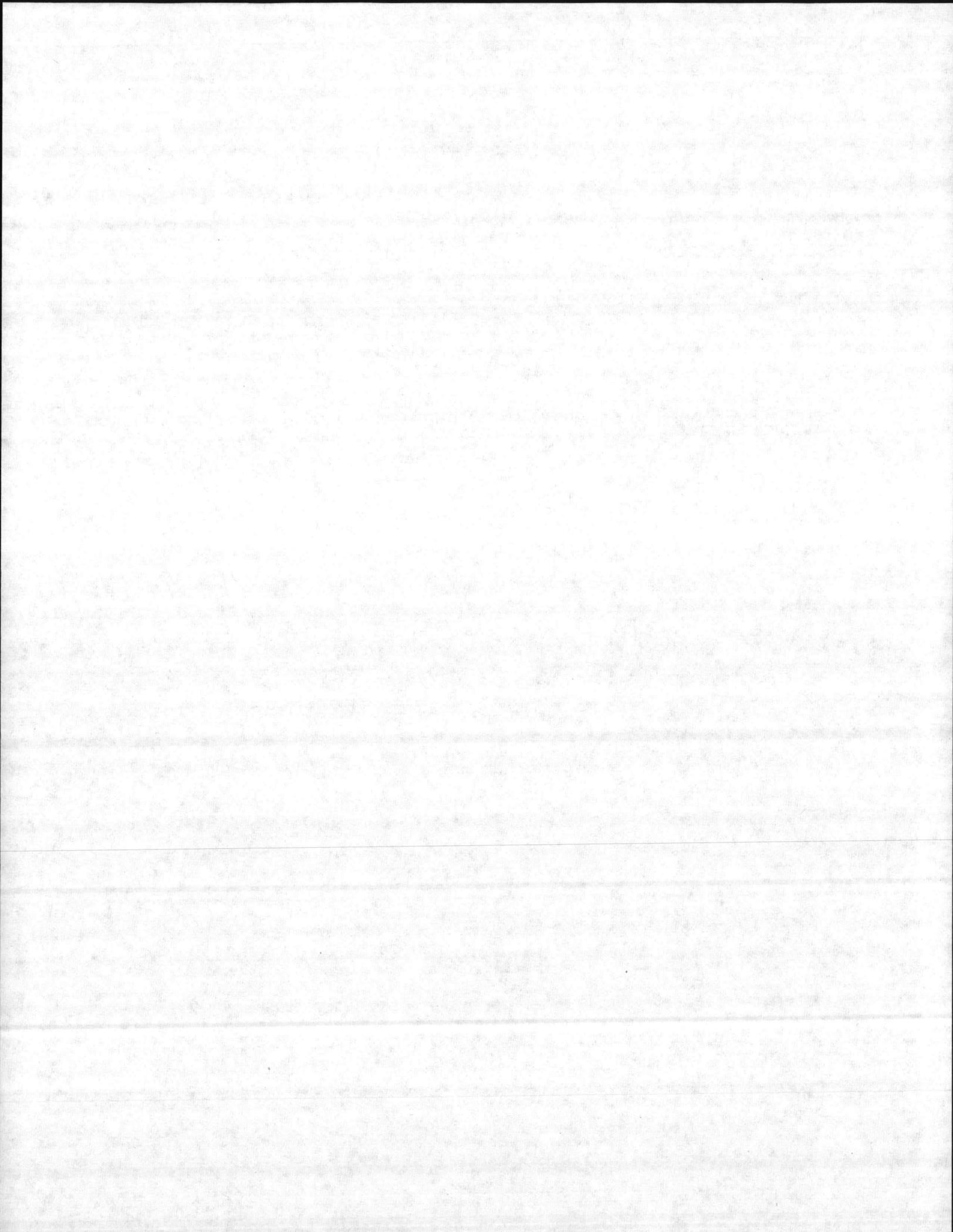
<u>HOURS P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
1	L	H0, T, TP

LESSON PURPOSE: To familiarize students with the various aspects in developing water sources.

NOTE: Learning objectives are neither specified nor measured during the lesson.

REFERENCE(S):

TM 5-700



UTILITIES OFFICER COURSE

SECTION IV - ANNEXES

ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F12

LESSON TITLE: DEVELOPMENT OF WATER POINT

<u>HOURS P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
2	L, D, A(I)	T, TP

TERMINAL LEARNING OBJECTIVE(S):

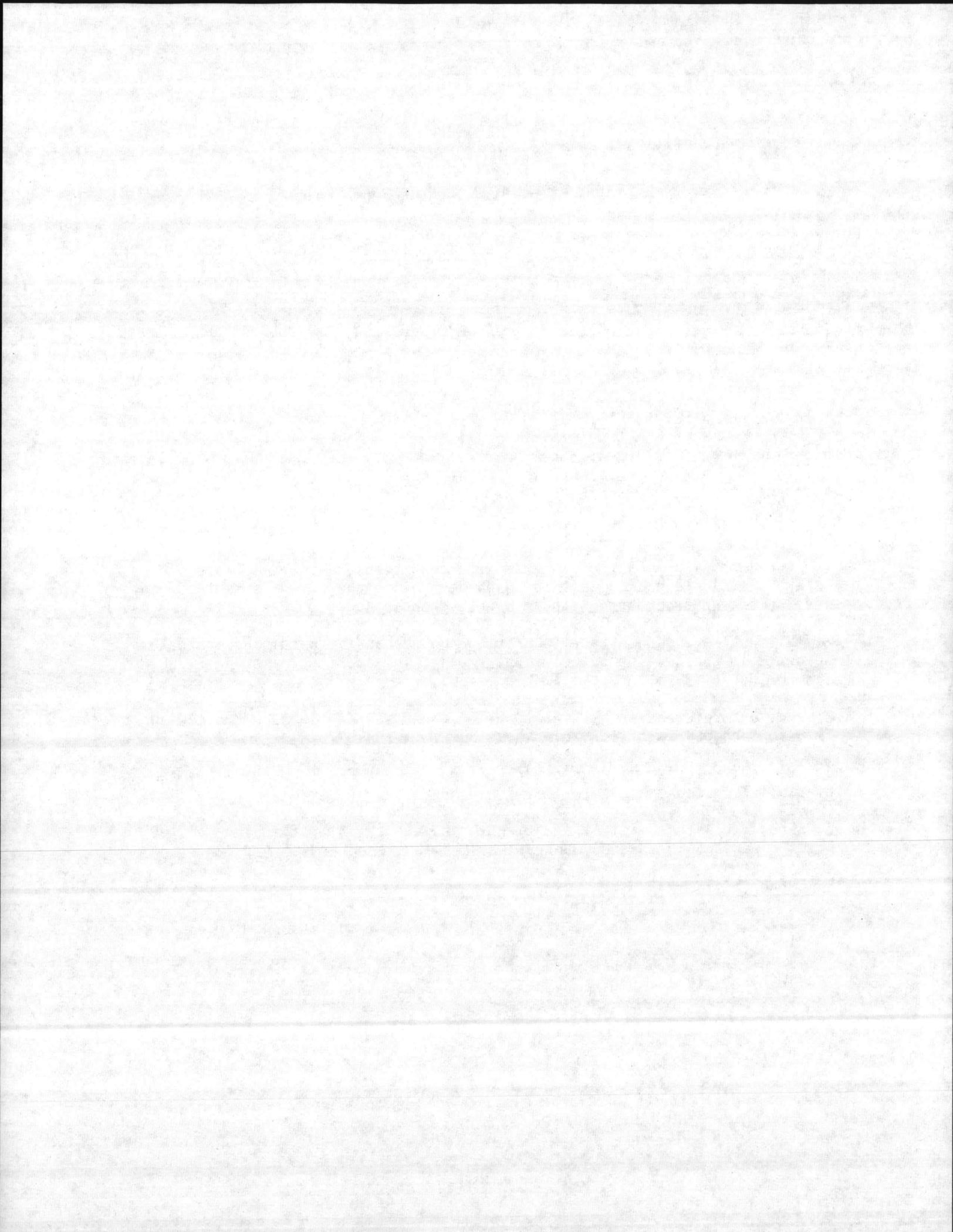
Given an operations order, taken to a raw water source, and tasked to plan the development of a water point, list the improvements required to develop the water point in accordance with TM 5-700, chapter 4. (1.3.2)

ENABLING LEARNING OBJECTIVE(S):

1. Provided with a list of water source conditions, without the aid of references circle each condition which determines the extent of water point development in accordance with TM 5-700, chapter 4. (1.3.2a)
2. Without references state in writing the methods of obtaining adequate drainage in the development of a water point in accordance with TM 5-700, chapter 4. (1.3.2b)
3. Without references list the types of water sources in accordance with TM 5-700, chapter 4. (1.3.2c)
4. Without references describe in writing the various forms of water storage platforms in accordance with TM 5-700, chapter 4. (1.3.2d)
5. Provided with a list of equipment, circle each item of equipment used in water distribution in accordance with TM 5-700, chapter 5. (1.3.2e)

REFERENCE(S):

TM 5700
TM 11275-15/3A



UTILITIES OFFICER COURSE

SECTION IV - ANNEXES

ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F14

LESSON TITLE: WATER RECONNAISSANCE

HOURS

P-M

METHODS

TRAINING SUPPORT EQUIPMENT

8

L, D, A(G)

AIO, T, TP, HO

TERMINAL LEARNING OBJECTIVE(S):

Provided with a map, color comparator, TM 5-700, DA Form 1711R, and DA Form 1712R, perform a water reconnaissance in accordance with TM 5-700, chapter 3. (1.3.1)

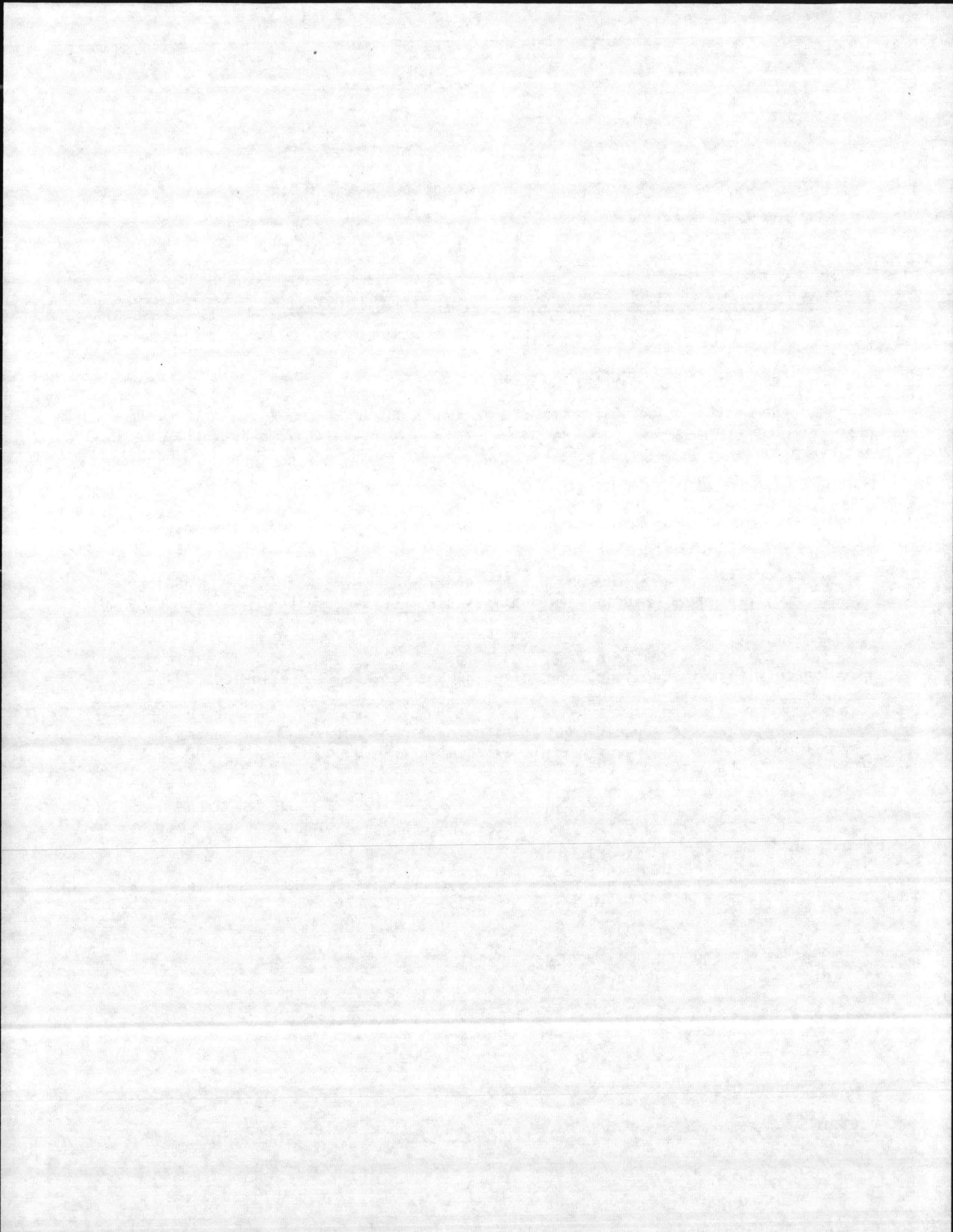
ENABLING LEARNING OBJECTIVE(S):

1. Furnished with a color comparator and a water sample drawn from a water source, perform a PH test in accordance with TM 5-700, pp. 89-90. (1.3.1a)
2. Furnished with a color comparator and a water sample drawn from a water source, perform a chlorine residual test in accordance with TM 5-700, pp. 80-81. (1.3.1b)
3. Provided with a field report and map, mark on the map each possible water source within the designated area for ground reconnaissance in accordance with TM 5-700, chapter 3. (1.3.1c)
4. When taken to a water source, with the aid of notes and references, calculate the quantity of water available in accordance with TM 5-700, pp. 168-172. (1.3.1d)
5. Provided with the necessary materials and water samples drawn from a water source, perform a coagulation jar test in accordance with TM 5-295, p. 117 (1.3.1e)
6. Provided necessary materials and a water sample perform a chlorine demand test in accordance with TM 5-700, pp. 93-94. (1.3.1f)
7. Provided with PH and chlorine residual reading and TM 5-295, compute requirements to produce 3,000 gallons of potable water in accordance with TM 5-295, p. 129. (1.3.1g)
8. Provided with DA Forms 1711R and 1712R, TM 5-700, and the results from routine control tests, complete each form in accordance with TM 5-700, pp 17-22. (1.3.1h)

REFERENCE(S):

TM 5-700

TM 5-295



UTILITIES OFFICER COURSE

SECTION IV - ANNEXES

ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F16

LESSON TITLE: WATER SUPPLY RECORDS

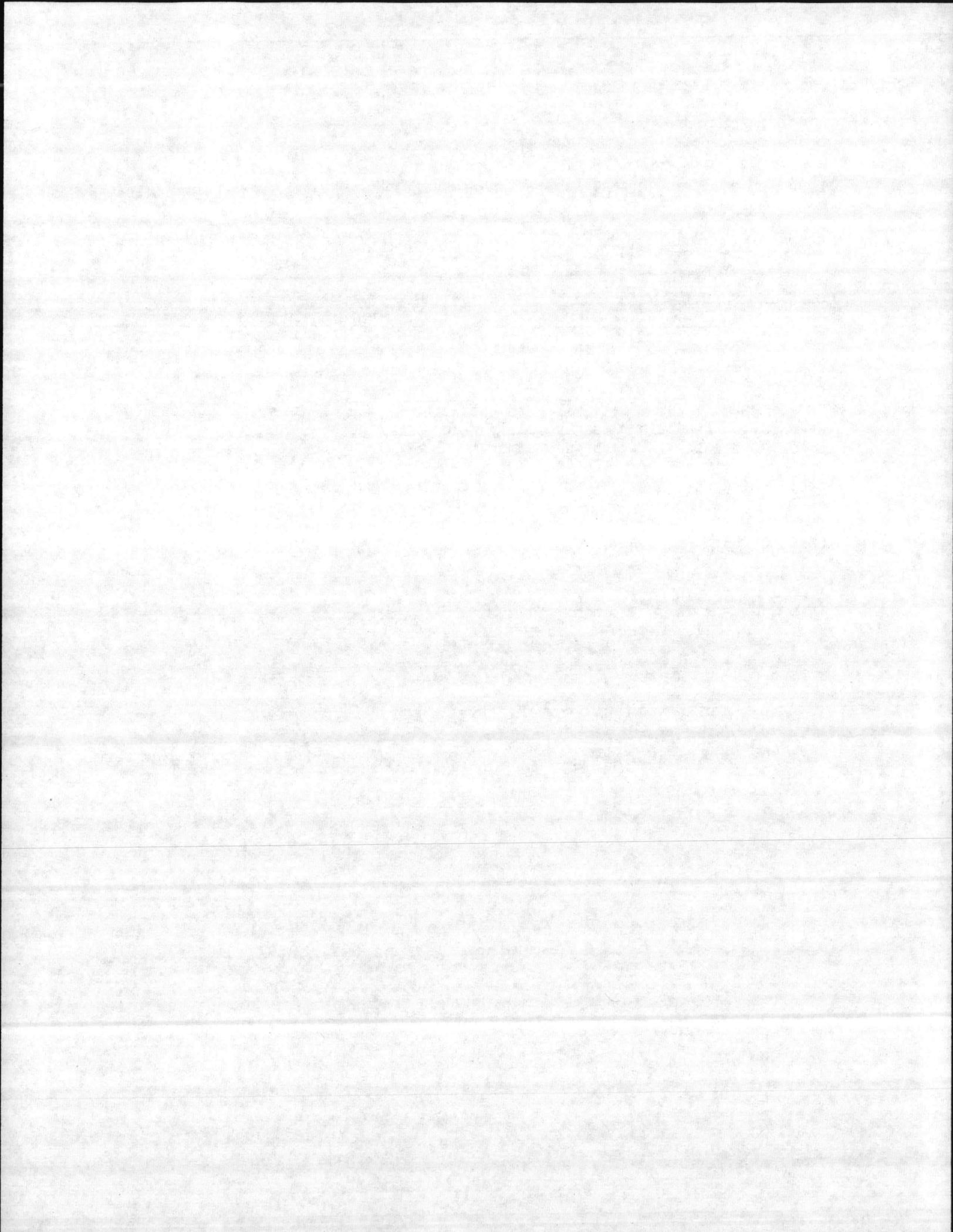
<u>HOURS</u> <u>P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
1	L, D, A(I)	T, TP, HO

LESSON PURPOSE: To familiarize student with the use of water production logs, water point inspection reports, daily water distribution logs, water production summary and water distribution summary.

NOTE: Learning objectives are neither specified nor measured during the lesson.

REFERENCE(S):

TM 5-700



UTILITIES OFFICER COURSE

SECTION IV - ANNEXES

ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F17

LESSON TITLE: INTRODUCTION TO WELLS

<u>HOURS</u> <u>P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
2	L	TP, T, S, F(35)

LESSON PURPOSE: To familiarize students with the various types of wells.

NOTE: Learning objectives are neither specified nor measured during the Lesson.

REFERENCE(S):

TM 5-700

UTILITIES OFFICER COURSE

SECTION IV - ANNEXES

ANNEX F - WATER SUPPLY MANAGEMENT

LESSON DESIGNATOR: U-02F18

LESSON TITLE: WELL DRILLING

<u>HOURS</u> <u>P-M</u>	<u>METHODS</u>	<u>TRAINING SUPPORT EQUIPMENT</u>
4	L	HO, T, TP

LESSON PURPOSE: To familiarize the student with the characteristics of the well drilling machine.

NOTE: Learning objectives are neither specified nor measured during the Lesson.

REFERENCE(S):

TM 00893B15

TM 009748-15

Baroid Drilling Mud Data Book

